

The Claims

1-9. (Withdrawn)

10. (Amended) A method of fabricating an electronic structure which comprises forming an insulating material on a substrate; lithographically defining and forming recesses for lines and/or via having sidewalls and bottom surface in the insulating material in which interconnection conductor material will be deposited;

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depositing a barrier layer on sidewalls and bottom surfaces of the recesses;

depositing copper on the barrier layer by electroplating from a bath having a pH of about 12.89 or greater, a source of cupric ions and a complexing agent and at a current density of about 5 to about $25\mu\text{A}/\text{cm}^2$.

11. (Original) The method of claim 10 wherein the copper is deposited to provide a thickness of about 10 nanometers to about 100 nanometers.

12. (Original) The method of claim 10 wherein the copper is deposited to provide a thickness of about 20 to about 50 nanometers.

13. (Original) The method of claim 10 wherein the barrier layer is selected from the group consisting of tungsten, alloys of tungsten, titanium, alloys of titanium, titanium nitride, tantalum, tantalum nitride and tantalum silicon nitride.

14. (Original) The method of claim 10 wherein the barrier layer has a thickness of at least about 4 nanometers.

15. (Original) The method of claim 10 wherein the barrier layer is tungsten.

16. (Original) The method of claim 10 wherein the dielectric is silicon dioxide.

17. (Original) The method of claim 10 wherein the recess has an aspect ratio of greater than 3:1.

18. (Original) The method of claim 10 wherein the electroplating bath is at a room temperature of about 22°C .

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B6* 19. (Amended) The method of claim 10 wherein the source of cupric ions is CuSO₄, and the complexing agent is EDTA or a salt of thereof..

20. (Original) The method of claim 19 wherein the electroplating bath comprises sodium hydroxide or potassium hydroxide.

21. (Original) The method of claim 10 wherein the electroplating bath further comprises a stabilizer and surfactant.

22. (Original) The method of claim 21 wherein the stabilizer is 2,2' -bipyridyl.

23. (Original) The method of claim 10 wherein the plating bath further comprises cyanide ions.

24-28. (Withdrawn)

29. (Newly added) The method of claim 10 wherein said current density is 10 to about 20 $\mu\text{A}/\text{cm}^2$.

B6 30. (Newly added) The method of claim 29 wherein the depositing of the copper is carried out at a rate of about 5 to about 25 $\mu\text{A}/\text{cm}^2$.

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B6* 31. (Newly added) The method of claim 10 wherein the depositing of the copper is carried out at a rate of about 5 to about 25 $\mu\text{A}/\text{cm}^2$.